First of a Series on

TREES

TREES

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 385

October 7, 1961

Trees

When the United States was first settled, it is estimated that almost half the land—over 800 million acres—was covered with forests. Today more than half the original forested area of the United States has been stripped of its trees. Although some of the cutting had to be done for good reasons, much of it was done without regard for the consequences. Today we realize that one of America's greatest natural resources is her treasure of trees, and logging now is carried on with care and with an eye to the future. For every tree cut down, a new one is planted.

The United States covers such a vast expanse of territory from east to west and from north to south that it includes a wide variety of climates and soils. As a result, it has several different kinds of forests. The boundaries of these forests are not clear-cut but overlap somewhat.

The northern forest is found in southern Canada, New England, and from the Great Lakes region west to the prairies. Here the winters are long and cold, and the summers are short. Trees found here are a mixture of evergreens, including spruce, fir, balsam, and larch, as well as broad-leaved trees such as maple, aspen, and birch.

The deciduous forest (deciduous trees shed their leaves yearly) is the largest forest in the United States and covers twenty of the east-central states. It includes many kinds of broad-leaved trees, the most common being oak, hickory, beech, maple, and birch. This great variety of trees is supported by the heavy rainfall and rich soil of the region.

The southern forest is found along the coastal plain and the Gulf from North Carolina to Texas. The rainfall is abundant and the winters are mild, making growing conditions even better than in the central states, but the soil is sandy and poor in quality. However, evergreens are able to grow well.

To the west the rainfall becomes less and less and the trees begin to thin out and are smaller until the forest disappears completely and the prairies are reached. This is the great treeless region of the United States. Rainfall on the prairies is not

enough to allow trees to grow except along streams and rivers, but the grasses do very well.

West of the prairies, in the foothills of the Rockies, the western forests begin. The mountains are covered mostly with evergreens because these trees are the only ones that can tolerate the poor soil, the short growing season, the long bitterly cold winters, and the heavy snowfall. High on the mountains, close to timberline, are fir, spruce, and pine. On the lower slopes oak, cottonwood, aspen, and sycamore grow.

Another large evergreen forest lies along the Pacific coast, covering the slopes of the Sierras and the Cascade Range of California and Oregon. The Pacific forest is the most heavily forested area in the country. The mild climate and heavy rainfall make it possible for the largest trees in the world to grow there. More than half of the trees are Douglas fir, while hemlock and cedar grow in smaller numbers. The world-famous sequoias grow at the southern edge of this forest.

These then are the original homes of our native trees. In many of our states the original forests have completely disappeared, and the surviving trees are left as single individuals or in small groves scattered among the ever-expanding towns, cities, and farms.

This page is for your own notes and illustrations

Second of a Series on

TREES

ELM

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 386

October 14, 1961

Elm

The American elm is certainly one of the best known and beloved of our native trees. It is the pride of villages and cities alike. No other tree is as closely related to American history as is the elm. The tree in Boston, known as the Liberty Tree, under which the colonists met to voice their anger against the Stamp Act of 1765, is an elm. It was under an elm called the Cambridge Elm that General George Washington took command of the Continental Army on July 3, 1775. Near the city of Philadelphia is the Penn Treaty Elm, a tree made famous because it was under its branches that William Penn made his offering of friendship to the Indians of that region.

The American elm is justly famous for its beautiful graceful form. Unfortunately very little of its beauty lies beneath its bark. Elm wood has little to offer the makers of fine furniture either in beauty or workability. The bark, however, was used by the Woodland Indians of the eastern United States for various utensils, and a strong rope was made of the stringy portion of the bark. The Iroquois Indians of western New York State used the bark for canoes and covered their houses with slabs of bark. The early settlers used elm bark for making chair bottoms—by first soaking the bark in water and then stripping off long flat strips.

Through the years the American elm has remained the great favorite of the American people. This tree, which may reach a height of 120 feet, is the tallest of the six elms native to eastern North America. In thickly forested regions the elm produces a straight, ridged trunk about sixty feet high before branching. But the form we know best is the one that develops when the elm grows in the open. There the trunk forks much closer to the ground into several erect limbs whose smaller branches and twigs form the wide-arching crown. This graceful silhouette has been described in several ways—as a vase, an umbrella, and even a feather duster.

In the fall the leaves turn a bright golden yellow and, later, brown. Then suddenly, almost overnight, the leaves fall to the ground. Elm buds are eaten by grouse and bobwhites, the twigs by deer and rabbits, and the fruits of some elms by squirrels and other small animals.

The American elm grows in almost any kind of soil—from coarse sand to clay—but it grows best on wet flats, swamp margins, and bottomlands. On higher ground it is often found growing with other kinds of broad-leaved trees.

Many of our city parks and streets are made more beautiful by the presence of American elms. However, the American elm is attacked by many diseases, one of the most deadly being Dutch elm disease, which is caused by a fungus. This serious disease was introduced from Europe when a few shipments of infected logs were brought to this country to make fancy veneers. The knotty and twisted grain, which at the time seemed so beautiful, was but the sad result of the disease. Within recent years this disease has caused the death of many American elms, and now it threatens to wipe out the tree entirely. So far, the only defense against the disease has been to cut down and destroy infected trees so that the healthy trees are not contaminated. This, of course, means spending large sums of money and disfiguring many of our streets and parks where many infected trees are found. In parts of the United States Dutch elm disease has even been discovered in forests, and this is causing deep concern.

This page is for your own notes and illustrations

Third of a Series on

TREES

TULIP TREE

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 387

October 21, 1961

Tulip Tree

The tallest and one of the most massive of the broad-leaved trees native to the United States is the tulip tree. The largest tulip tree on record measured 198 feet in height and 12 feet in diameter. Normally, however, a full-grown tulip tree is 100 to 150 feet tall and 6 to 8 feet in diameter.

This tree is unusual because only two kinds of tulip trees exist today—one in the eastern part of the United States and the other in China. Fossil records, however, show that before the Ice Age tulip trees flourished in Europe and Asia. Perhaps one of the reasons why the European tulip trees died out was that as the ice advanced the trees became "trapped" between it and the towering mountains, which, in the Old World generally, lie in an east-west direction. In North America, where the mountain ranges generally lie in a north-south direction, tulip trees were able to "move" ahead of the advancing ice front by slowly seeding southward. When the ice began to recede, the trees slowly began to move northward again. This may also be one of the reasons for the great variety of trees found in the United States today.

The tulip tree grows best on rich, fairly moist soil that is well drained. Sometimes the tulip tree may be found growing alone in a forest or in a small woods along with the white oak, hickory, basswood, black cherry, and black walnut.

No other native North American tree has leaves with a squarish outline. The tulip-like flowers, from which the tree gets its name, appear in May or June after the tree is in full leaf. The greenish-yellow petals have an orange band across their bases. Later in the season the flowers produce conelike clusters of narrow-winged seeds that are scattered about by the wind or by the many small animals that eat them.

Tulip-tree seedlings grow quickly and need abundant light. Their very thin bark, however, makes them especially vulnerable to damage by fire. Livestock also cause much damage because they like to eat tulip-tree seedlings. Although the tree has few insect enemies, several kinds of wood-rotting fungi enter

through fire scars or other wounds and infect the tree.

Because the tulip tree is intolerant of shade, the branches below the crown wither and die, leaving a trunk free of knots. A high percentage of usable lumber may be obtained from such a tree. The tulip tree is one of our most important "hardwoods" although the wood is actually quite soft and easily worked. It is made into furniture, crates, boxes, and radio and television cabinets. Because the wood has no smell nor taste, it is often used for making food containers. Tulip-tree logs were sometimes used by pioneers for building cabins.

The tulip tree is well adapted for planting along streets and is often used as a shade tree. Its huge size, however, is much better suited to wide rather than narrow streets. It is a member of the Magnolia family, which dates far back in geologic times.

The tulip tree has many names. Lumbermen call it yellow poplar, although it is not a poplar. In the country, people call it a poplar, sometimes tulip poplar, and sometimes just tulip. In Tennessee it is known as canoewood. In colonial times it was called whitewood, and in Virginia and Pennsylvania, in those early times, it was known as the canoe tree because the Indians made dugouts from its trunk. The tulip tree is one of the few deciduous trees to turn bright yellow in fall.

This page is for your own notes and illustrations

Fourth of a Series on

TREES

MAPLE

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 388

October 28, 1961

Maple

In New England and the Midwest the fall season is the time when the countryside is aflame with blazing crimsons, golds, and scarlets. Of all the trees that add color to the autumn landscape, none is more brilliant than the beautiful maple!

There is, however, more to the maple than beauty alone. About twelve different kinds of maples are native to the United States and Canada, and they grow from the Atlantic Ocean all the way to the Pacific coast. But nearly a hundred different kinds of maples grow in the northern hemisphere! Maple trees and shrubs grow even south of the equator. China and Japan seem to be the original home of the maples, for in those two countries alone thirty different kinds of maples grow.

Even ancient people valued maple wood. The Romans used European maples for pikes and lances as well as for tables and other furniture. Especially valued is "curly" maple and "bird's-eye" maple, the grain of which forms beautiful patterns. These woods are used in making expensive furniture. Such wood patterns do not occur often, and nothing on the outside of the tree indicates that its lumber is so marked.

Of all the maples, the sugar maple is the best known because of its sweet sap. The Indians of eastern North America taught the Europeans how to

collect the sap and boil it down to make sugar. A tubular spout was inserted into a small hole drilled in the trunk, and sap that oozed out was collected in small buckets. The sap was then boiled down to make syrup. When boiled longer, the syrup, on cooling, crystallized into sugar. Tapping the maples, which was begun in mid-February when the sap began to run and usually contained the highest concentration of sugar, continued from four to six weeks.

Vermont and New York are the two biggest producers of maple products in the United States, and Quebec is the leading producer in Canada. Maple sugar and syrup are also important spring crops on many farms in Ohio, Pennsylvania, and Michigan. The yearly production is about four million gallons of syrup and 925,000 pounds of sugar, and almost all of this is obtained from wild trees.

The sugar maple is one of the most valuable trees in the eastern forests of America. Maple trees most often grow in a community of trees such as beech, yellow birch, basswood, tulip tree, and several kinds of oaks. Maples that grow in the open tend to have a short trunk and a thick round crown, while those that grow in a forest have smaller crowns and more slender trunks as tall as 130 feet. Some maples grow nicely in the city, and they are often planted along streets and in parks, but the sugar maple does not do well in the city because of the smoke and gases.

Only a few kinds of trees have their leaves arranged oppositely, and the maple is one of them. In the spring, maple flowers appear at about the same time as the leaves. The greenish-yellow flowers are so small that most people never notice them. The fruit of the maple is called a samara, or key. It is made up of two seeds joined together and attached to the twig by a long slender stem. Each seed has its own wing. When ripe, the seeds split apart, and each seed spins toward the earth with the wing acting like a propeller—allowing the wind to blow the seed for a long distance. Maple seeds are eaten by birds, chipmunks, and squirrels. In winter the twigs are eaten by deer and moose.

This page is for your own notes and illustrations

Fifth of a Series on

TREES

SYCAMORE

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 389

November 4, 1961

Sycamore

Many of the rivers that wind through the rolling countryside of the Midwest are lined with sycamores whose massive irregular crowns indicate the river's course. Sycamores grow throughout the eastern half of the country, but they reach their greatest height in the rich bottomlands of the lower Ohio and Mississippi river valleys. Sycamores are ruggedly handsome trees that may be from 70 to 120 feet high. Sometimes, though, giants reaching 170 feet in height and 14 feet in diameter have been found.

The sycamore's huge size would be enough to identify it as the most massive of any American broad-leaved tree. It has other characteristics, however, that are unmistakable. It is the only tree whose trunk and branches look as if they had been daubed with paints of various colors—brown, green, yellow, gray, and creamy white. This strange patchwork of colors extends up the trunk to some of the larger branches. The smaller branches look as if they had been painted white—their bark is so light.

Young sycamores have a smooth-fitting grayish-green bark. As they grow older, however, the bark begins to flake off, exposing patches of different colors. Botanists explain this by stating that the sycamore bark is not so elastic as the bark of other trees and therefore cannot expand as the trunk gets thicker with age. This "molting" process continues throughout the growing season.

Another easily recognized characteristic of the sycamore is its fruit. The fruit, a small ball about one inch in diameter, is made up of many closely packed nutlets and hangs from the branches of the tree by a slender stem that is 3 to 4 inches long. The ball remains on the tree for most of the months that the tree is leafless and looks like a button. Because of these "buttons" the sycamore is also known as the buttonwood tree. Early in the spring the ball breaks up, and the tiny nuts are scattered by the wind. The huge yellowish-green leaves of the sycamore may be eight inches long. They look a little like

large maple leaves. This sometimes confuses people, but a closer look reveals that sycamore leaves are arranged alternately on the stem—not oppositely as are maple leaves.

Interestingly enough, next year's buds cannot be seen until the leaves fall off in the autumn. The leaf stem is cup-shaped where it is attached to the twig. It serves as a protective covering for next year's bud, which it completely hides from view.

The sycamore produces huge numbers of seeds every year, but the seeds need very moist soil in which to grow well. When sycamore trees are cut down, sprouts readily develop from their stumps. Thus the number of trees is maintained in this way as well as by seeding.

The French who settled in Illinois during the early years of our country's history used sycamore trunks for dugouts, and it is said that one such dugout was sixty-five feet long and could carry four and one-half tons of cargo.

Sycamore wood is tough, hard to split, decays quickly in the ground, and is little used commercially today. However, the sycamore is often planted in parks and along streets because it is one of the few trees that will grow rapidly and flourish in spite of dust and smoke. The sycamore is closely related to the oriental plane tree that was cherished by ancient Greeks and Romans who planted it for its shade.

This page is for your own notes and illustrations

Sixth of a Series on

TREES

HICKORY

by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 390

November 11, 1961

Hickory

The hickory is as American as the Fourth of July and apple pie! Only one kind of hickory grows outside of North America, and that one grows in China. Of the twelve different kinds of hickory trees native to the United States, eleven may be found growing in the state of Arkansas. Fossil remains prove that hickories once grew in Europe and the Mediterranean countries long before the Ice Age.

Of all the hickories none is so important or widespread as the shagbark. The name shagbark comes from the fact that the bark on old trees forms plates that are loose at one or both ends. This gives the trunk a shaggy appearance. The bark on young trees is smooth and close-fitting.

The crown is somewhat irregular in outline and may stand from 120 to 140 feet above the ground. The leaves, which are 8 to 14 inches long with usually five leaflets, give off a fragrance when they are crushed. The fruit has a thick outer husk that splits into four sections when ripe, and the seed, which is enclosed in a hard-shelled nut, is sweet and edible.

The shagbark is a vigorous grower in the eastern third of the country except along the southeast and Gulf coasts. Very rarely does shagbark hickory form a pure stand. Usually it grows mixed with oaks and other broad-leaved trees.

The Indians of long ago crushed hickory nuts to obtain an oil that an early writer said was used for stomach upsets. Another writer said that venison broth was thickened and made more tasty by adding pulverized nuts, shells and all, of certain hickories. In the fall Creek and Algonquin Indians gathered ripened nuts and stored them away for future eating. Oil pressed from hickory nuts, which was used in cooking in colonial times, was considered as good as olive oil in flavor.

As a fruit tree the shagbark deserves our greatest attention, but its valuable lumber has led to cutting down the largest trees in our woods. No other commercial wood has the same welcome combination of strength, elasticity, and toughness of hickory, and no other American hardwood could substitute very well for hickory in case of a shortage of supply. Hickory wood is used for handles of axes, picks, hammers, and hatchets because it can withstand sudden shocks without shattering. Hickory wood was preferred for making wagon-wheel spokes and rims. Baseball bats and skis today are mainly made of hickory. It provides one of the best woods for fuel because it produces great heat and long-lasting coals for baking and broiling. Smoldering hickory-wood fires are used for smoking meats. The early pioneers learned the value of hickory for this purpose many years ago, and to this day no one has been able to improve on this method. Hickory wood produces an excellent charcoal, and the ashes are useful for soapmaking.

The closely related pecan, which is the most valuable commercially of the hickories, is cultivated for its thin-shelled delicious nuts. The nuts grow in clusters of three to eleven at the tips of the branches and by their distinctive shape serve to distinguish the tree from other hickories. The tree can be recognized in late summer or fall by the four-parted husks, which remain on the branches after they have opened to release the nuts.

Originally pecans grew only in the south-central states from Illinois and Missouri to Louisiana and Texas. Now cultivated varieties have been introduced into a number of southern and eastern states for their valuable crop.

This page is for your own notes and illustrations

Seventh of a Series on

TREES

CHESTNUT

by

MARIE SVOBODA

Raymond Foundation

CHICAGO NATURAL HISTORY MUSEUM
RESEARCH EDUCATION
FOUNDED 1893 BY MARSHALL FIELD

Museum Stories, No. 391

November 18, 1961

Chestnut

If a person were to walk into some of the New England woods, he might see a ghostly white tree bearing no leaves on its dead branches. And if that person were to stop and listen very hard, he might think that he heard, very faintly, the whoops of joy with which the boys and girls of long ago greeted the tall handsome chestnut and its crop of delicious nuts. But the boys and girls are long since gone, and the chestnut tree no longer flourishes. It and almost all the other American chestnuts are dead—victims of the chestnut-blight fungus that appeared in this country in 1904.

Before 1904 the chestnut tree grew in great numbers in the eastern part of the United States. The tree grew readily, even sending up sprouts from the stumps. Sometimes the chestnut grew to a height of a hundred feet or more, and its trunk became 4 to 8 feet in diameter. This tree was one of the most important hardwoods, and lumbermen valued it highly for its coarse brown wood, which was easily worked. Furniture, railroad ties, and wall paneling were some of the items made of chestnut wood, which was also an important source of tannin for leather-making. Boys and girls, however, were far more impressed with the crop of sweet nuts.

The chestnuts are enclosed in a prickly husk that frost alone can open. Inside are several oval nuts, flattened on one side, their shells a rich warm brown. This is the color we have in mind when we describe something as "chestnut brown." The shells have a high polish except at the base where the nut is attached to the bur. There it is a soft downy gray.

But the days when boys and girls could roam through the woods competing with squirrels and other small animals for the sweet kernels have long since gone. The chestnut-blight fungus took care of that. The fungus responsible for the damage entered the tree through wounds in the bark. The cottony threadlike body of the fungus spread rapidly in the living tissue just under the bark and soon encircled the trunk. Thus the crown of the tree was cut off from the root system and the tree

died. Soon after the disease appeared in this country, it spread quickly. The spores of the fungus were scattered over great distances by the wind, making all attempts to contain the disease hopeless. Those chestnuts growing in Europe and Asia are hardly affected by the disease because through many centuries of exposure to the disease they have developed an immunity to it. Unfortunately the disease is deadly to the American kind.

Today the dead stumps still send up shoots that grow vigorously for a time, even setting forth fruit, but soon the deadly blight sets in and the young chestnut tree dies. Other shoots appear to take the place of those that died but they, too, last only a short time, resembling shrubs more than tall trees—all victims of the fungus that continues to live in some parts of the roots. Today very few, if any, of the original chestnut trees remain, but stumps and tree skeletons in many woods tell us that long ago chestnut trees were common there. Most of the chestnuts sold in our markets today come from Italy, but their flavor is not so good as that of our own American chestnuts.

Botanists are still hoping to find a blight-resistant chestnut, but so far they have not been successful. It seems that the trees grown from nuts collected from sprouts are no more resistant to the disease than the old tree from which the sprouts grew.

This page is for your own notes and illustrations

Eighth of a Series on

TREES

OAK

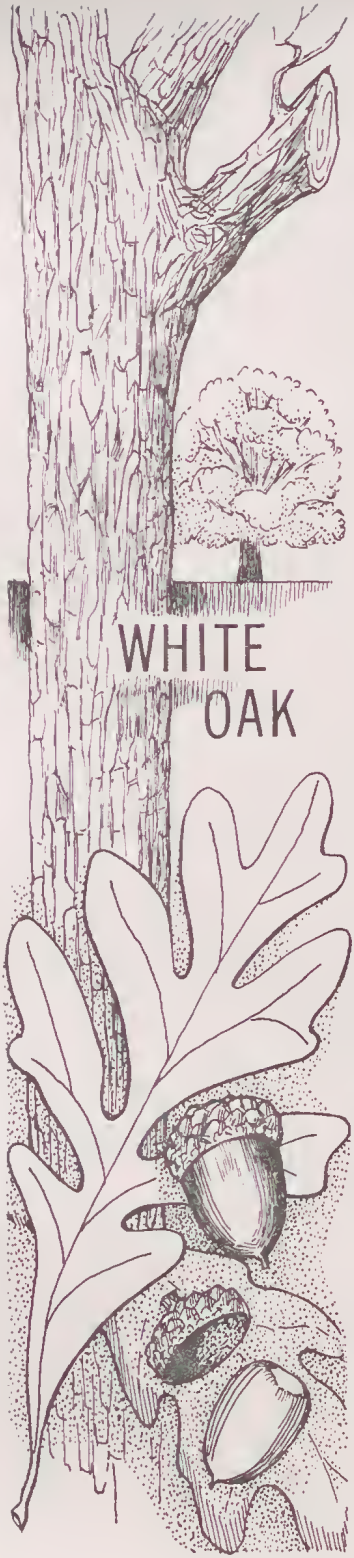
by

MARIE SVOBODA

Raymond Foundation

Museum Stories, No. 392

November 25, 1961



Oak

The strength and majesty of the oak have caused it to become a symbol of strength since ancient times. So strong is man's regard for the oak that, more than any other tree, the oak has become an important part of man's myths and legends. To the ancient Greeks, the oak was the special tree of Zeus, their chief god.

Another reason for man's interest in the oak is, perhaps, the fact that it grows in almost every country north of the equator. In North America alone, dozens of oaks are native.

Oak flowers appear at about the same time as the leaves. The very tiny male flowers, which produce pollen, form drooping clusters called catkins. The very tiny female flowers, which produce the seeds, appear where the leaf stem is attached to the twig. These flowers produce the fruit, which is a seed, or nut, enclosed in a scaly cup. The fruit of the oak is called an acorn. Acorns, which are first produced when the tree is about twenty years old, are then produced during the rest of the tree's lifetime, which may be from 200 to 300 years.

All oaks may be divided into two groups, the white oaks and the black oaks. The white-oak group whose sweet acorns mature in one year (there are no acorns on the branches during the winter months) have leaves with rounded

lobes and are rough and light-colored below. The oaks that belong to this group are the white, chestnut, bur, post, and chinquapin. The black-oak group includes those oaks whose bitter acorns take two years to mature (the acorns may be seen on the branches during the winter months) and have leaves whose lobes end in sharp points and are almost as smooth above as below. To this group belong the black, red, scarlet, pin, Spanish, scrub, blackjack, laurel, and willow oaks.

Many of the oaks are from 80 to 100 feet tall, but those that grow on the western slopes of the Alleghany Mountains are the tallest. There the oaks may grow to a height of 150 feet with a trunk diameter of 6 to 8 feet.

Our largest native oak is the red oak, which grows tall and strong and quickly, even in the north country where the winds are icy and the winter snows are deep. The bitter acorns of the red oak are very seldom, if ever, eaten by animals, with the result that most of the acorns sprout into trees. Because it grows so quickly, is so hardy, and gives such abundant shade, the red oak is planted in Europe in greater numbers than any other native American oak.

The white oak is perhaps our most important timber tree. It is a tall tree (up to 80 feet in height) with a trunk diameter of 6 to 8 feet. It has few natural enemies, the worst of which is fire. Its wood is hard, strong, and heavy. Oak has been used since early times in shipbuilding, particularly for ribs and keels. Today it is used for making furniture, farm tools, pilings, flooring, and railroad ties. To outdoorsmen it is an ideal firewood because it burns down to a bed of hot glowing coals that is perfect for broiling foods.

Because the sweet acorns of the white oak are the favorite food of squirrels and other small animals, comparatively few acorns are left on the ground to produce seedlings, although white-oak trees are numerous. The fact that squirrels sometimes bury acorns for future eating and often forget them may be one of the reasons why white-oak trees are widespread. The white oak is seldom planted for ornamental purposes because it grows too slowly and transplanting is difficult.

This page is for your own notes and illustrations